Mail Stop AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE THE APPLICATION OF	)	**O'CONNELL, DAVID**
SERIAL NO.:	)	**09/680,829**
FILED:	)	**October 6, 2000**
FOR:	)	**Monitoring quality of service in packet-based communications**
CUSTOMER NUMBER	)	**23644**
CONFIRMATION NO.	)	**2651**
ART UNIT:	)	**2471**
EXAMINER:	)	**MEW, Kevin D**
ATTORNEY DOCKET NO.	)	**920673-907240**

RESPONSE TO OFFICE ACTION OF FEBRUARY 22, 2010

Honorable Director of Patents and Trademarks
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir,

In response to the Examiner's Office Action of February 22, 2010 the Applicants make the following amendments and remarks:

In the Claims

Claims 7 and 10-12 are cancelled without prejudice. Claims 1, 13, 14, 34-47 and 50 are amended as follows.

1. (currently amended) A method of monitoring quality of service in telephony communications over a packet-based network between two points, at least one of which is an endpoint,

wherein said endpoint is a telephony device having an interface which is accessible to a user to enable said user to participate in a telephony session over the network;

said telephony device further having an output for presenting information to said user;

the method comprising the steps of:

transmitting test packets across the network while a telephony session including said telephony device is in progress and monitoring transmission characteristics of said test packets, said test packets including a first series of test packets which issue from a source location to a destination location and a second series of test packets which issue from said destination location to said source location in response to said first series of test packets;

dynamically calculating from said transmission characteristics a measure of network performance comprising a measure of packet loss by comparing the packets issued from the source location and the packets received back at the source location,

using the measure of packet loss and the identity of the communications codec being employed by the endpoint to calculate an equipment impairment factor (Ie); and

providing at said output of said telephony device a dynamic indication of said equipment impairment factor (Ie)~~the network performance based on said calculation~~ during said telephony session.

2. (original) A method according to claim 1, wherein said transmission characteristics are selected from packet loss, transmission delay, and a combination thereof.

3. (original) A method according to claim 2, wherein said transmission characteristics include both packet loss and transmission delay.

4. (original) A method according to claim 1, wherein the indication of the network performance is provided by means of a visual display associated with the endpoint.

5. (previously amended) A method according to claim 1, wherein the indication of the network performance is provided by means of an aural signal provided to the endpoint.

6. (original) A method according to claim 5, wherein the aural indication of the network performance is provided as a discrete signal emitted at the endpoint when the value of the metric passes a predetermined point.

7. (cancelled)

8. (currently amended) A method according to claim ~~7~~1, wherein the first series of test packets include local source timestamp information and wherein the second series of test packets include local destination timestamp information, the difference between said local source timestamp information and local destination timestamp information being used to calculate a delay characteristic of the network.

9. (original) A method according to claim 8, wherein the delay characteristic is the absolute delay in echo-free connections (Ta) between the source and destination locations over the network.

10. (cancelled)

11. (cancelled)

12. (cancelled)

13. (currently amended) A method according to claim ~~12~~1, wherein the calculation of Ie is made by looking up the measured packet loss in a stored table which correlates values of Ie with packet loss values for the codec being used.

14. (currently amended) A method according to claim ~~11~~1, wherein the calculated value of Ta is used to calculate a delay impairment factor.

15. (original) A method according to claim 14, wherein the delay impairment factor (Idd) is given by the formulae:

(i) for Ta < 100ms,

Idd = 0; and

(ii) for Ta => 100 ms,

Idd = 25*((1+X6)1/6 - 3*(1+(X/3)6)1/6 + 2)

Where X = (log(Ta/100))/log(2)

16. (original) A method according to claim 15, wherein a transmission rating factor R is calculated from the formula R = Y - Idd - Ie, where Y is a constant which has been predetermined for the network and the equipment being used on the network, and wherein Ie is an equipment impairment factor calculated from the measure of packet loss and the identity of the communications codec being employed by the endpoint.

17. (original) A method according to claim 16, wherein the calculation of Ie is made by looking up the measured packet loss in a stored table which correlates values of Ie with packet loss values for the codec being used.

18. (original) A method according to claim 17, wherein the value of Y is from about 92 to about 97.

19. (original) A method according to claim 18, wherein the value of Y is from about 93 to about 95.

20. (original) A method according to claim 19, wherein the value of Y is about 94.5.

21. (original) A method according to claim 16, wherein the calculated value of R is correlated to a subjective metric for the quality of service, and wherein an indication of the value of said subjective metric is provided at the endpoint to a user.

22. (original) A method according to claim 21, wherein said metric is a mean opinion score (MOS) and is calculated according to the formula:

$$MOS = 1 + 0.035R + R(R-60)(100-R)(7x10-6)$$

23. (original) A method according to claim 22, wherein said MOS is further adjusted before being provided as an indication at the endpoint, by normalising acceptable values of MOS to a different scale.

24. (original) A method according to claim 21, wherein the indication of the value of the subjective metric is provided by means of a visual display associated with the endpoint.

25. (original) A method according to claim 21, wherein the indication of the value of the subjective metric is provided by means of an aural signal provided to the endpoint.

26. (original) A method according to claim 25, wherein the aural indication is provided as a discrete signal emitted at the endpoint when the value of the metric passes a predetermined point.

27. (original) A method according to claim 1, wherein the step of providing a dynamic indication of the network performance includes providing, at the request of a user, an indication of one or more of said transmission characteristics.

28. (original) A method according to claim 27, wherein the request of the user is made by means of an input device associated with the endpoint and the indication is provided by means of a display device associated with the endpoint.

29. (original) A method according to claim 1, further comprising the step of logging the network transmission characteristics.

30. (original) A method according to claim 1, further comprising the step of logging the results of said calculation.

31. (original) A method according to claim 30, wherein the step of logging the results of said calculation occurs only when said results are within a predetermined range.

32. (currently amended) A method ~~according to claim 30~~of monitoring quality of service in telephony communications over a packet-based network between two points, at least one of which is an endpoint,

wherein said endpoint is a telephony device having an interface which is accessible to a user to enable said user to participate in a telephony session over the network;

said telephony device further having an output for presenting information to said user;

the method comprising the steps of:

transmitting test packets across the network while a telephony session including said telephony device is in progress and monitoring transmission characteristics of said test packets;

dynamically calculating from said transmission characteristics a measure of network performance;

providing at said output of said telephony device a dynamic indication of the network performance based on said calculation during said telephony session; and

logging the results of said calculation~~, wherein the step of logging also~~ includ~~es~~ing logging the fact that a communications connection over the network has been lost.

33. (original) A method according to claim 1, further comprising the step of adjusting a billing record for a user in dependence on the results of said calculation.

34. (currently amended) A non-transitory computer-readable medium encoded with a data structure or computer program to perform a method which, when executed on a processor associated with an endpoint connected to a packet-based network, said endpoint being a telephony device having an interface which is accessible to a user to enable said user to participate in a telephony session over said network, said telephony device further having an output for presenting information to said user, cause said processor to:

monitor transmission characteristics of test packets transmitted across the network while a telephony session including said telecommunications device is in progress;

dynamically calculate from said transmission characteristics a measure of network performance; ~~and~~

provide to said user at said output of said endpoint a dynamic indication of the network performance based on said calculation during said telephony session; and

logging the results of said calculation including logging the fact that a communications connection over the network has been lost.

35. (currently amended) A non-transitory computer-readable medium according to claim 34, wherein said transmission characteristics are selected from packet loss, transmission delay, and a combination thereof.

36. (currently amended) A non-transitory computer-readable medium according to claim 35, wherein the transmission characteristics include the absolute delay in echo-free connections (Ta) between source and destination locations over the network, obtained by comparing local timestamp information from source and destination locations on the network and a measure of packet loss obtained by comparing the packets issued from the source location and the packets received back at the source location.

37. (currently amended) A non-transitory computer-readable medium according to claim 36, wherein the measure of packet loss and the identity of the communications codec being employed by the endpoint are used to calculate an equipment impairment factor (Ie).

38. (currently amended) A non-transitory computer-readable medium according to claim 37, wherein a delay impairment factor (Idd) is given by the formulae:

(i) for Ta < 100ms,

Idd = 0; and

(ii) for Ta => 100 ms,

Idd = 25*((1+X6)1/6 - 3*(1+(X/3)6)1/6 + 2)

Where X = (log(Ta/100))/log(2)

39. (currently amended) A non-transitory computer-readable medium according to claim 38, wherein a transmission rating factor R is calculated from the formula R = Y - Idd - Ie, where Y is a constant which has been predetermined for the network and the equipment being used on the network, and wherein Ie is an equipment

impairment factor calculated from the measure of packet loss and the identity of the communications codec being employed by the endpoint.

40. (currently amended) A non-transitory computer-readable medium according to claim 39, wherein the value of Y is from about 92 to about 97.

41. (currently amended) A non-transitory computer-readable medium according to claim 40, wherein the value of Y is from about 93 to about 95.

42. (currently amended) A non-transitory computer-readable medium according to claim 41, wherein the value of Y is about 94.5.

43. (currently amended) A non-transitory computer-readable medium according to claim 39, wherein the calculated value of R is correlated to a subjective metric for the quality of service, and wherein an indication of the value of said subjective metric is provided at the endpoint to a user.

44. (currently amended) A non-transitory computer-readable medium according to claim 34, wherein provision of a dynamic indication of the network performance includes providing, at the request of a user, an indication of one or more of said transmission characteristics.

45. (currently amended) A non-transitory computer-readable medium according to claim 34, further comprising instructions which when executed cause a computer to log the network transmission characteristics.

46. (currently amended) A non-transitory computer-readable medium according to claim 34, further comprising instructions which when executed cause a computer to log the results of said calculation.

47. (currently amended) A non-transitory computer-readable medium according to claim 34, further comprising instructions which when executed cause a computer to adjust a billing record for the a in dependence on the results of said calculation.

48. (cancelled)

49. (cancelled)

50. (currently amended) A system for monitoring quality of service in communications over a packet-based network, comprising:

a source endpoint connected to the network via which a user may transmit communication signals as part of a telephony session over the network wherein said source endpoint is a telephony device having an interface which is accessible to a user to enable said user to participate in a telephony session over the network;

a test packet generator for transmitting a first series of test packets across the network during said telephony session

a test packet receiver for receiving a second series of test packets from the network during said telephony session in response to said first series of test packets;

a processor for measuring transmission characteristics of said test packets and for calculating from said transmission characteristics a measure of network performance comprising a measure of packet loss by comparing the packets issued from the source location and the packets received back at the source location, and for using the measure of packet loss and the identity of the communications codec being employed by the endpoint to calculate an equipment impairment factor (Ie); and

an output associated with said telecommunications device for providing a dynamic indication of said equipment impairment factor (Ie)~~the network performance~~ to said user during said telephony session~~ based on said calculation~~.

51. (original) A system according to claim 50, wherein said test packet generator includes a timestamp generator for adding a local source timestamp to said test packets.

52. (original) A system according to claim 51, further comprising a destination endpoint with which said source endpoint is in communication over the network, said

destination endpoint having associated therewith: a test packet receiver for receiving test packets from the network; a timestamp generator for adding a local destination timestamp to said received test packets; and a test packet re-transmitter for re-transmitting said received test packets with said local destination timestamp back to their source.

53. (previously presented) A system according to claim 52, further comprising a centralized time server in communication with the network for generating a standardized time and providing same to said source and destination endpoints.

54. (previously presented) A method of monitoring quality of service in communications over a packet-based network between two points, at least one of which is an endpoint, comprising the steps of:

transmitting a first series of test packets location across the network from a source location to a destination, said first series of test packets including local source timestamp information;

transmitting a second series of test packets location across the network from said destination to said source location in response to the first series, said second series of test packets including local destination timestamp information;

measuring the difference between said local source timestamp information and local destination timestamp information; and

calculating from said measured difference the absolute delay in echo-free connections (Ta) between the source and destination locations over the network and thereby calculating a delay impairment factor;

providing at said endpoint a dynamic indication of the network performance based on said delay impairment factor.

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Remarks

Amendment after final

It is respectfully requested that the above amendments be entered after final action, in accordance with MPEP 714.12, on the grounds that they place the application in condition for allowance. All of the claims have been amended to subject-matter which had been indicated as allowable.

Claim objections 35 USC § 101

Claims 34-47 have been amended to claim a *"non-transitory computer-readable medium"*. The Examiner's assistance in suggesting an allowable amendment in this regard is appreciated

Claim rejections 35 USC § 103

Claim 1 has been amended to incorporate the subject-matter of claim 12 and intervening claims 7, 10 and 11. Claim 12 had been objected to but indicated as allowable if placed in independent form including all of the limitations of the base claim and any intervening claims. Accordingly it is submitted that amended claim 1 is now allowable as are dependent claims 2-6, 8, 9, 13-31 and 33.

Claim 32 has been amended to place it in independent form including all of the limitations of the base claim and any intervening claims. Accordingly it is submitted that claim 32 is allowable.

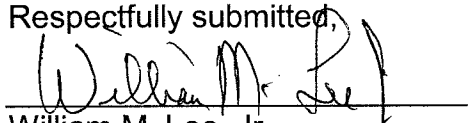
Claim 34 has been amended to place it in conformity with claim 32, and accordingly it is submitted that claim 34 is allowable for at least the same reasons as indicated in the office action's statement of allowable subject-matter for claim 32, as are dependent claims 35-47.

Claim 50 has been amended to include the same limitations as claim 1 and claim 50 is therefore allowable for at least the same reasons as indicated in the office action's statement of allowable subject-matter for claim 12, as are dependent claims 51-53.

In view of the amendments and arguments made herein, it is respectfully submitted that all of the rejections are now moot and that all claims are allowable for at least the reasons indicated in the office action in respect of claims 12, 32 and 54.

April 15, 2010

Respectfully submitted,



William M. Lee, Jr.
Registration No. 26935
Barnes & Thornburg LLP
P.O. Box 2786
Chicago, Illinois 60690-2786
(312) 214-4800
(312) 759-5646 –WLEE 595174v1